

# Uses of SQL in Accessing and Analyzing the Spreadsheets

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## Abstract

*The spreadsheets are the foremost wide used management applications with interactive Graphical computer program. Most the business, industrial or business databases are keeping mistreatment spreadsheets. It's been ascertained that a computer program is used as an electronic database management system while not mistreatment any programming language paradigm. Utilizing varied operators of relative pure mathematics by mistreatment computer program functions it is achieved. By giving a selected definition of info in SQL, a book of computer program with empty datasheets and sheets of formulas for SQL queries is enforced. All the info manipulations operations like insertion, deletion, retrieval and modification performed by users will then be handled by computer program functions. However the end-users should bear in mind of SQL Queries so as to use such a model. In the present paper, we tend to approach such downside by ending mapping of linguistic communication queries into their associated SQL queries.*

**Keywords:** DBMS, Spreadsheets, SQL.

## 1. Introduction

A program is interactive laptop application for organization, analysis and storage of knowledge in tabular kind. Spreadsheets are developed as processed simulations of paper accounting worksheets. The program operates on information entered in cells of a table. Every cell might contain either numeric or text information, or the results of formulas that mechanically calculate and show a price supported the contents of different cells. A program may additionally talk to one such electronic document.

The spreadsheet users will modify any keep worth and observe the consequences on calculated values. This makes the program helpful for "what-if" analysis since several cases are often chop-chop investigated while not manual calculation. Trendy program package will have multiple interacting sheets, and might show information either as text and numerals, or in graphical kind (Sarkar et al., 2014).

The key feature of spreadsheets is that the ability for a formula to talk to the contents of different cells, which can successively be the results of a formula. To create such a formula, one merely replaces variety with a cell reference. As an example, the formula=5\*C10 would manufacture the results of multiplying the worth in cell C10 by the amount five. If C10 holds the worth three the result are going to be fifteen. However C10 may additionally hold its own formula concerning different cells, and so on.

The ability to chain formulas along is what provides a program its power. Several issues will be lessened into a series of individual mathematical steps, and these will be appointed to individual formulas in cells. A number of these formulas will apply to ranges yet, just like the add operate that adds up all the numbers inside a spread.

Spreadsheets share several principles and traits of databases; however spreadsheets and databases don't seem to be identical issue. A program is actually only single tabled, whereas info could be an assortment of the many tables with machine-readable linguistics relationships between them. Whereas it's true that a book that contains three sheets is so a file containing multiple tables that may move with one another, it lacks the relative structure of info. Spreadsheets and databases are interoperable-sheets will be foreign into databases to become tables inside them, and info queries will be exported into spreadsheets for additional analysis.

A program is one in all the most elements of workplace productivity suite that typically additionally contains an applications program, a presentation program, and a management system. Programs inside a set use similar commands for similar functions. Typically sharing knowledge between the elements is less complicated than with a non-integrated assortment of functionally equivalent programs. This was significantly a plus at a time once several laptop computer systems used text-mode displays and commands, rather than a graphical interface.

In the late 1980's and early 1990's, initial Javelin code and Lotus Improv appeared. Not like models during a standard program, they used models designed on objects known as variables, not on information in cells of a report. These multi-dimensional spreadsheets enabled viewing information and algorithms in numerous self-documenting ways in which, together with synchronous multiple synchronal views. For instance, users of Javelin may move through the connections between variables on a diagram whereas seeing the logical roots and branches of every variable. This is often an example of what's maybe its primary contribution of the sooner Javelin-the construct of traceability of a user's logic or model structure through its twelve views. A fancy model are often cleft and understood by others those had no role in its creation (Spreadsheet, From Wikipedia, 2017).

In these programs, a statistic, or any variable, was an object in itself, not a group of cells that happen to seem during a row or column. Variables may have several attributes, together with complete awareness of their connections to all or any different variables, information references, and text and image notes. Calculations were performed on these objects, as hostile a variety of cells, thus adding two statistics mechanically aligns them in calendar time, or during a user-defined timeframe. Information was freelance of worksheets-variables, and so information, couldn't be destroyed by deleting a row, column or entire worksheet. As an example, January's prices are ablated from January's revenues, despite wherever or whether or not either seems during a worksheet. This allows actions later employed in pivot tables, except that versatile manipulation of report tables was however one amongst several capabilities supported by variables. Moreover, if prices were entered by week and revenues by month, the program may assign or interpolate as acceptable. This object style enabled variables and whole models to reference one another with user-defined variable names, and to perform multidimensional analysis and large, however simply editable consolidations (Spreadsheet, From Wikipedia, 2017), (Power, 2014).

SQL could be a domain-specific language utilized in programming and designed for managing information control in a very electronic information service management system (RDBMS) or for stream process in a very relative information stream management system (RDSMS).

Originally based mostly upon relative pure mathematics and tuple relative calculus, SQL consists of an information definition language, information manipulation language, and information management language. The scope of SQL includes information insert, query, update and delete, schema creation and modification, and information access management. Though SQL is commonly represented as, and to a good extent is, a declarative language (4GL), it conjointly includes procedural parts (Chamberlin et al., 2007).

SQL was one amongst the primary industrial languages for F. Codd's relative model, as represented in his potent 1970 paper, i.e., about a relative Model of information for big Shared information Banks. Despite not entirely adhering to the relative model as represented by Codd, it became the foremost wide used information language.

SQL became a customary of the yank National Standards Institute (ANSI) in 1986, and of the world organization for Standardization (ISO) in 1987. Since then, the quality has been revised to incorporate a bigger set of options. Despite the existence of such standards, most SQL code isn't fully moveable among completely different information systems while not changes (Melton et al., 1993), (Lorentz et al., 2010), (SQL From Wikipedia, 2017). The fig-1 and fig-2 represent SSMS Query and getting external data from SQL server respectively (Web Source, 2017, <http://www.spreadsheetsmadeeasy.com/excel-create-pivot-table-using-sql/>).

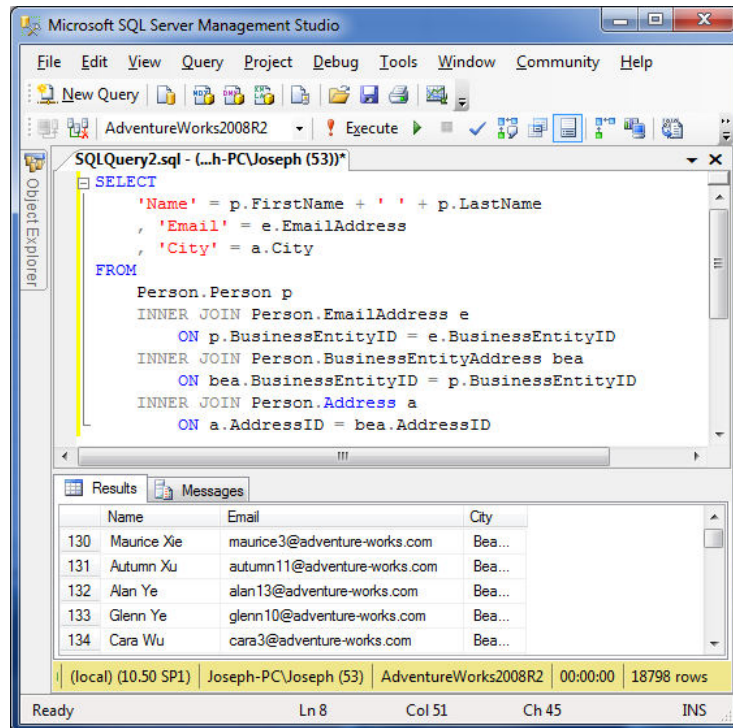


Figure 1 SSMS Query

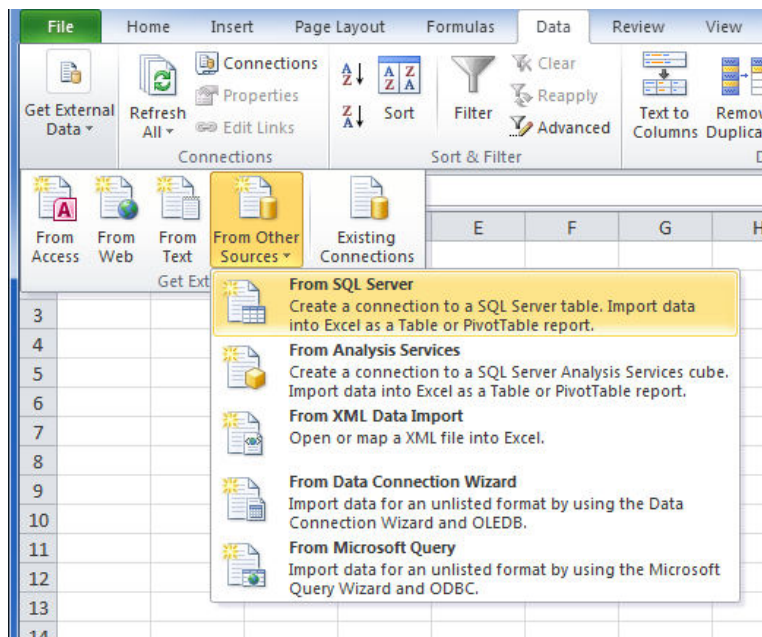


Figure 2 Getting External Data from SQL Server

The SQL language is categorized into many language components, (Lorentz et al., 2010) that include:

- The Clauses that are constituent parts of statements and queries.
- The expressions that may manufacture either scalar values, or tables consisting of columns and rows of knowledge predicates, that specify conditions that may be evaluated to SQL-3VL or Boolean truth values and are wont to limit the consequences of statements and queries, or to vary program flow.
- The Queries that retrieve the info supported specific criteria i.e., a crucial part of SQL.
- The statements that can have a persistent result on schemata and knowledge, or could management transactions, program flow, connections, sessions, or medical speciality.

- The SQL statements additionally embrace the punctuation (";") statement killer though not needed on each platform, it's outlined as a customary a part of the SQL descriptive linguistics.
- The insignificant whitespace is usually neglected in SQL statements and queries, creating it easier to format SQL code for readability.

## 2. Literature Review

B. Liu et al., have designed an epitome implementation of the program pure mathematics and show, through user studies with non-technical subjects that the resultant question interface is less complicated to use than a regular business visual question builder (Liu et al., 2009).

A. Giordani et al., have approached question respondent targeting information info by mechanically generating SQL queries in response of the posed question. Their methodology exploits grammatical dependencies and information matching (Giordani et al., 2012).

J. Sroka et al., have analyzed that information operations become on the market to the users those don't need to migrate to information. They'll outline their queries employing a problem-oriented language and so get their execution plans in an exceedingly plain vanilla program. The functions on the market in spreadsheets impose limitations on the algorithms one will implement. They provide  $O(n \log^2 n)$  sorting spreadsheet, employing a non-constant range of rows, and, amazingly, Depth-First-Search and Breadth-First-Search on graphs (Sroka et al., 2015).

P. Danawale et al., have established that SQL is mechanically born-again into computer program code. They need shown the facility of the computer program paradigm that subsumes the paradigm of relative databases. Aside from SQL, they need conjointly applied a couple of specific algorithms: a linear sorting procedure and two graph traversing algorithms: BFS and DFS (Danawale et al., 2015).

E. R. Kadam et al., have incontestable the force of the computer program worldview that subsumes the worldview of social databases. Because the following strides they arrange to produce enhancements for SQL inquiries deciphered into spreadsheets. They intrigued whether or not spreadsheets will commonly execute totally different models of databases, just like semi-organized or question social ones. With the assistance of this tool little business doesn't have to migrate to the info. (Kadam et al., 2016)

D. Chaudhari et al., (2016) have incontestable that computer program is enforced with the assistance of SQL. Thus it is raised the strength of spreadsheets by victimization electronic database model. Moreover, looking out potency of computer program is raised by victimization traversing algorithms: DFS and BFS. A language processor has been enforced to extend the interactivity of spreadsheets for end-users. The potency of language processor is raised by victimization Hidden Andre Markoff Models for locating the chance of a word from language within the clauses of SQL queries alongside acceptable linguistics (Chaudhari et al., 2016).

P. U. Wani et al., have shown the facility of the computer program paradigm that subsumes the paradigm of relative databases. During this system question Translator helps users to cut back human generating error whereas writing SQL queries (Wani et al., 2016).

M. V. Sadaphule et al., have engineered an automatic tool for changing the SQL Queries to formula based mostly spreadsheets. The report discusses regarding the thought of the system, its necessities, modules, design, and implementation details briefly. The essential necessities, assumptions thought-about and therefore the dependencies needed for building the system are well understood. The planning and results enclosed provides user a more robust plan to look at and perceive the system alright (Sadaphule et al., 2016).

R. Ramya et al., have planned machine-controlled tool Query-Converter makes it straightforward for users to research and manage the information on giant scale reducing the human generated errors whereas writing the info queries. Additionally bound drawbacks of unfold sheets and SQL are overcome, up performance of the system. The most goal is to translate the queries into unfold sheets that generate ends up in the unfold sheet type. The mentioned graph traversal algorithms may be accustomed implement algorithmic queries over hierarchies that are encountered in follow. It may be believed that the mentioned approach isn't solely applicable to end-user programmers however



additionally to the skilled users to style extension of programming languages and environments. SQL have established that it may be mechanically reborn into computer program code. Except for SQL, have additionally applied some specific algorithms: a linear sorting procedure and 2 graph traversing algorithms: BFS and DFS (Ramya et al., 2017).

### 3. Functional Model

A purposeful info consists of a group of dimensions that are accustomed construct a group of cubes. A dimension could be a finite set of components, or members, that determine business information, e.g., time periods, products, areas or regions, line items, etc. Cubes are engineered mistreatment any range of dimensions. A cube could be an assortment of cells, every of that is known by a tuple of components, one from every dimension of the cube. Every cell during a cube contains a price. A cube is effectively performed that assigns a price to every n-tuple of the product of the scale.

The value of a cell could also be allotted outwardly (input), or the results of a calculation that uses different cells within the same cube or different cubes. The definition of a cube includes the formulas that specify the calculation of such cells. Cells may additionally be empty and deemed to own a zero price for functions of consolidation.

As with spreadsheets, users needn't worry concerning execution computation. once the worth of a cell is requested, the worth that's came back is up so far with regard to the values of all of the cells that move into its calculation i.e. the cells on that it depends.

Dimensions usually contain consolidation hierarchies wherever some components are outlined as folks of different components, and a parent is taken because of its kids. Cells that are known by a consolidated component in one or a lot of dimensions square measure mechanically calculated by the purposeful model as sums of cells having kid components in those dimensions. Once the worth of a consolidated cell is requested, the worth that's came back is often up so far with regard to the values of all of the cells that it consolidates (Ramya et al., 2017)

### 4. Conclusion

We have incontestable that program is enforced with the assistance of SQL. Thereby it increasing the strength of spreadsheets by exploitation on-line database model. Moreover, looking out potency of program is magnified by exploitation traversing algorithms: DFS and BFS. A linguistic communication processor has been enforced to extend the interactivity of spreadsheets for end-users. The potency of linguistic communication processor is magnified by exploitation Hidden Markov Models for locating the likelihood of a word from linguistic communication within the clauses of SQL queries in conjunction with applicable linguistics. As for future step, we have a tendency to commit to develop the linguistic communication processor which might method input from totally different languages. The potency of linguistic communication processor has to be magnified in order that it will expeditiously convert the linguistic communication statements to applicable and correct SQL queries in order that relevant information is no heritable.

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